

**Claims**

1. An enhanced energy production system having the step of introducing steam at elevated temperature and a positive pressure into an enhanced reactor, wherein a portion of the energy added to the reactor system by the addition of the steam is used  
5 by reaction systems in the reactor to increase the number of dissociated H<sub>2</sub>O molecules at or near a reactive or catalytic surface.
2. An enhanced energy production system according to claim 1 wherein the steam introduced to the system is produced as a by-product of a method for generating hydrogen and/or energy from a chemical reaction including the steps of: selecting an  
10 electronegative half cell reaction producing hydrogen; selecting a first electropositive half cell reaction having a sufficient potential to drive said electronegative half cell reaction; selecting a second electropositive half cell reaction; said first and second electropositive half cell reactions selected in combination with said electronegative half cell reaction to produce an increase in hydrogen and/or energy production from  
15 water; and combining said half cell reactions.
3. An enhanced energy production system according to claim 1 further including a reaction system of one or more half cell reactions.
4. An enhanced energy production system according to claim 3 wherein the reaction system or half cell reactions require or are assisted by the provision of a  
20 reactive or catalytic surface.
5. An enhanced energy production system according to claim 3 wherein the reaction system includes on or more electropositive half cell reactions involving the oxidation of species selected from Group I or Group II metals, binary hydrides, ternary hydrides, amphoteric elements, electropositive elements in groups one and two of the  
25 periodic table and chelated transition elements, oxyacids of phosphorus and oxyacids of sulfur.
6. An enhanced energy production system according to claim 3, wherein the reaction system includes on or more electropositive half cell reactions involving a metal organic complex capable of changing configuration to release one or more  
30 electrons in a realisation of an increased co-ordination number.
7. An enhanced energy production system according to claim 3, wherein the reaction system includes the formation of a further semiconductive material or molecule.

8. An enhanced energy production system according to claim 7, wherein the semiconductive material or molecule is a composite material or molecule.

9. An enhanced energy production system according to claim 1, further including an associated heat exchange system that can be used to transfer heat from an exothermic chemical reaction in the cell or control the rate of exothermic chemical reaction(s).

10. An enhanced energy production system including a two part process for generating hydrogen and/or energy, the first part being a primary reaction system including the sub-steps of selecting an electronegative half cell reaction producing hydrogen; selecting a first electropositive half cell reaction having a sufficient potential to drive said electronegative half cell reaction; selecting a second electropositive half cell reaction; said first and second electropositive half cell reactions selected in combination with said electronegative half cell reaction to produce an increase in hydrogen and/or energy production from water; and combining said half cell reactions; and the second part including the introduction of steam produced as a by-product of the first step at elevated temperature and a positive pressure into an enhanced reactor, wherein a portion of the energy added to the reactor system by the addition of the steam is used by reaction systems in the reactor to increase the number of dissociated H<sub>2</sub>O molecules at or near a reactive or catalytic surface.